Dicing of APV Readout Chips for FGT & IST

Gerrit van Nieuwenhuizen

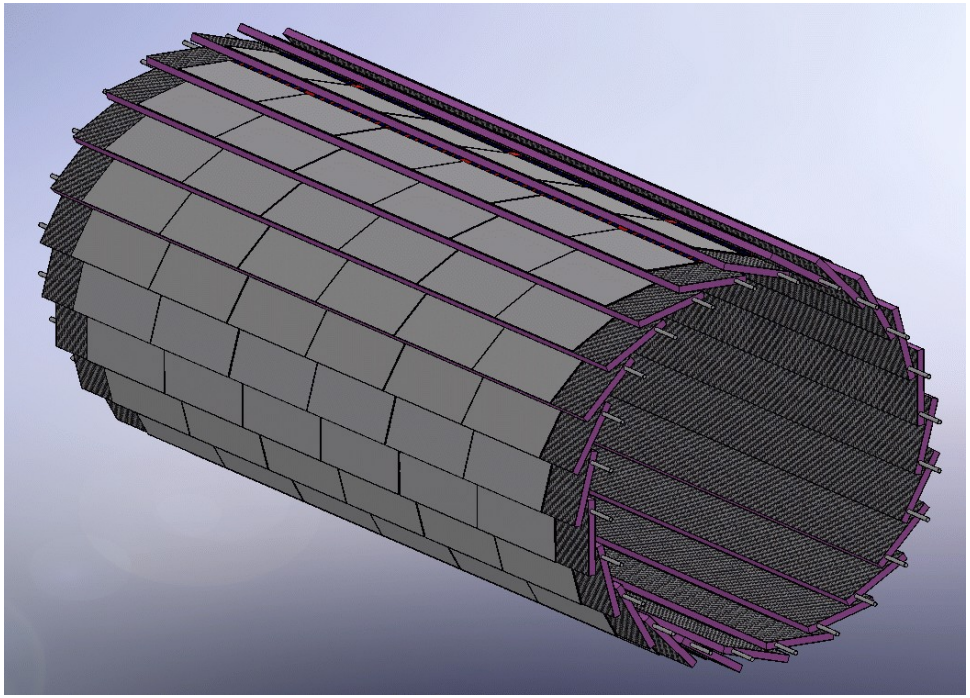
FGT meeting

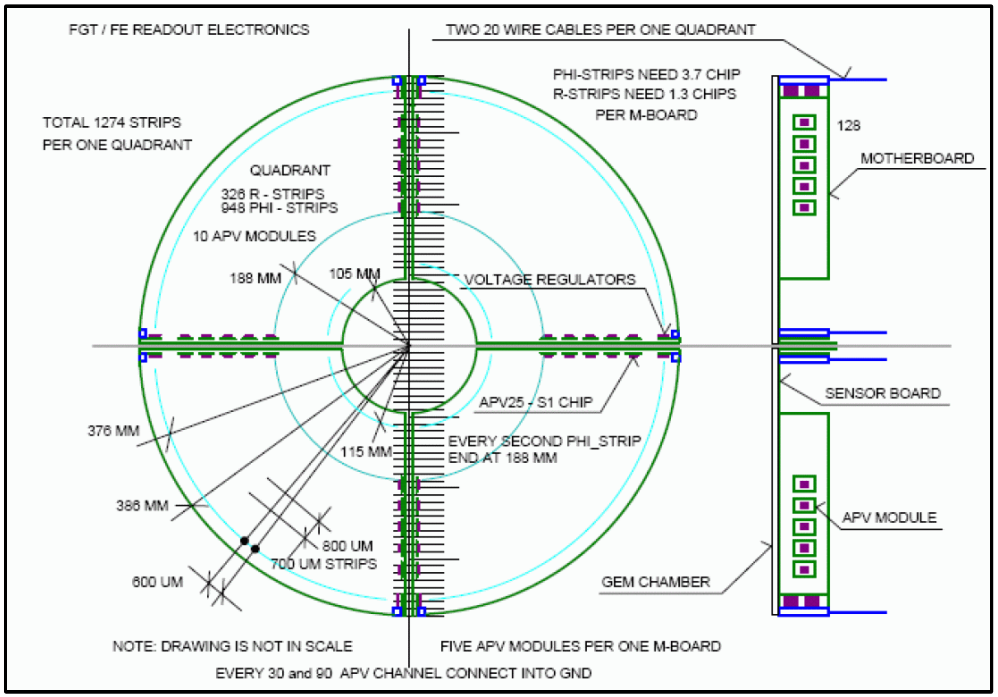
BNL, February 27, 2009

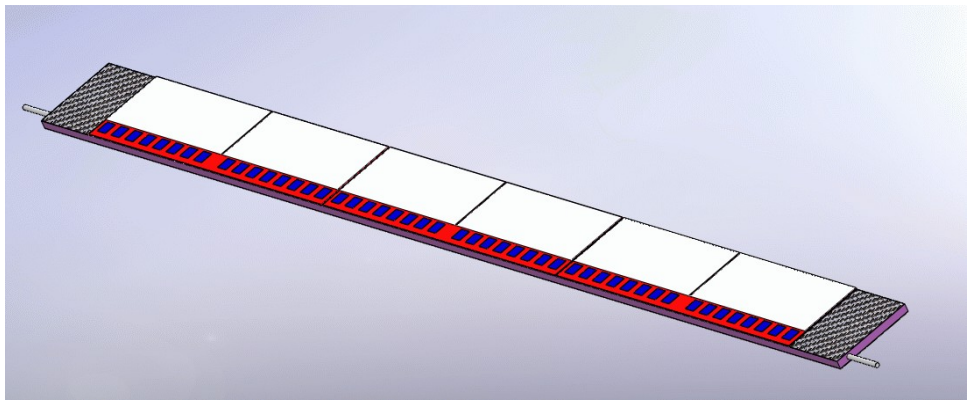
The STAR experiment

at the Relativistic Heavy Ion Collider, Brookhaven National Laboratory

Number of chips needed





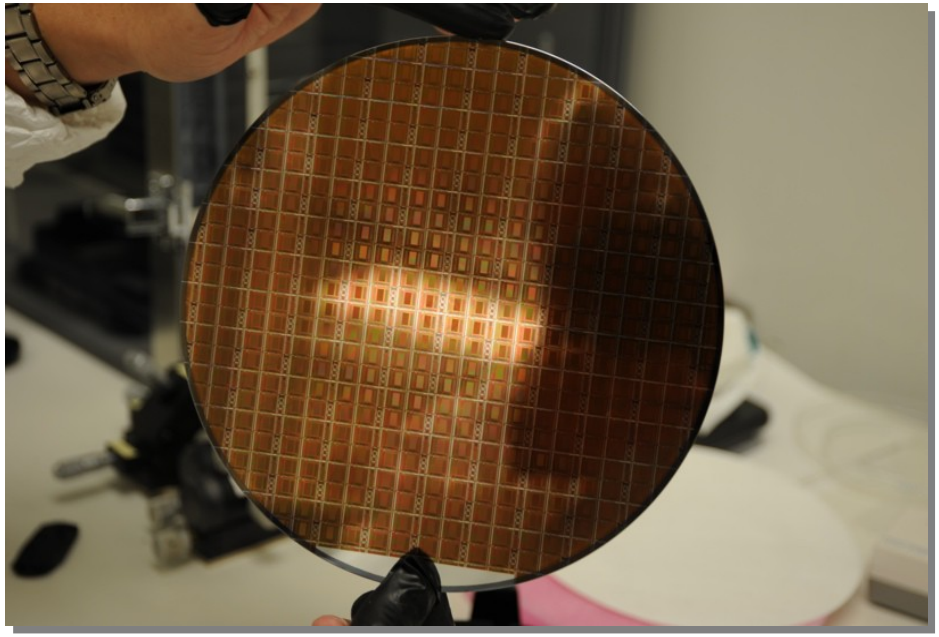


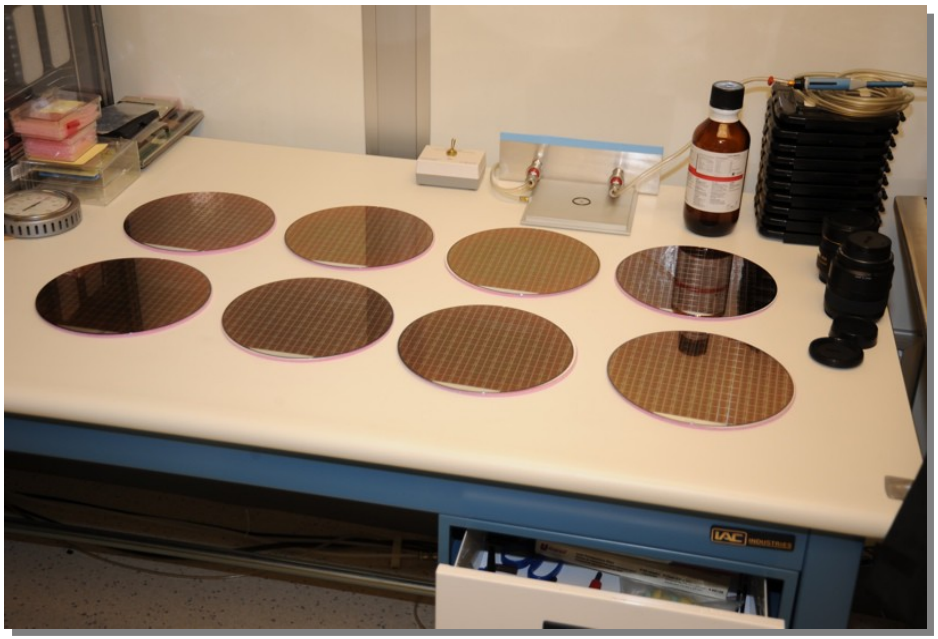
FGT: 600 chips (50% spares, 40% cont.)

IST: 1800 chips (10% spares, 40% cont.)

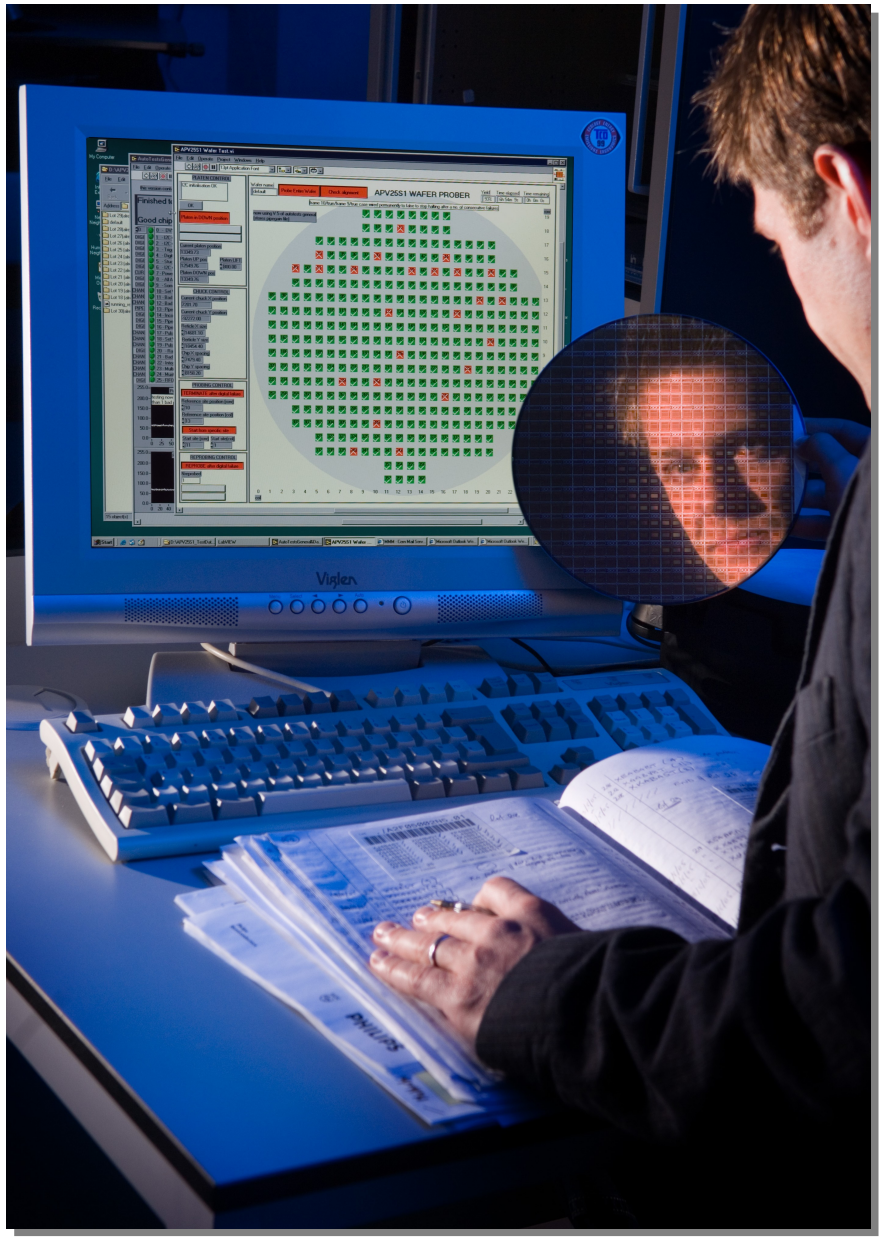
2400 APV25-S1 chips to procure

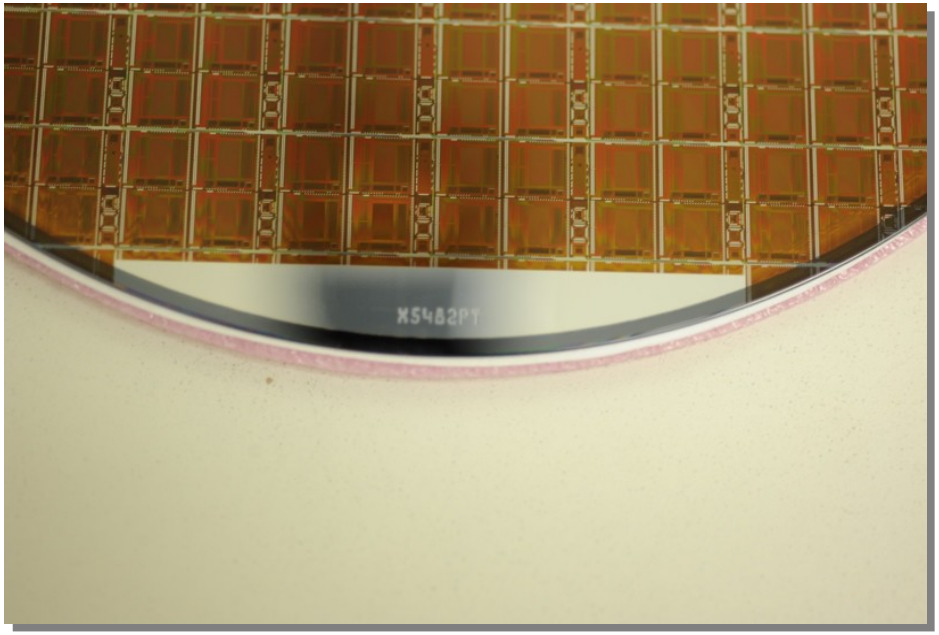
8 APV Wafers at MIT





How many good chips?





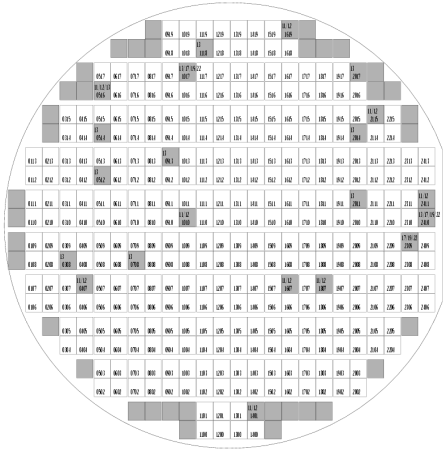
Each wafer has its ID etched in

All chips on the wafers were probed for functionality

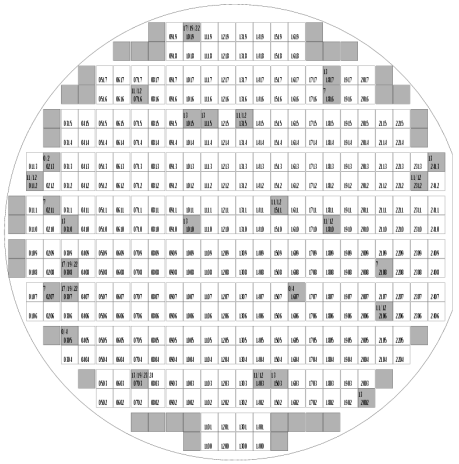
Good chip maps are available for all wafers

Known Good Die (KGD) maps

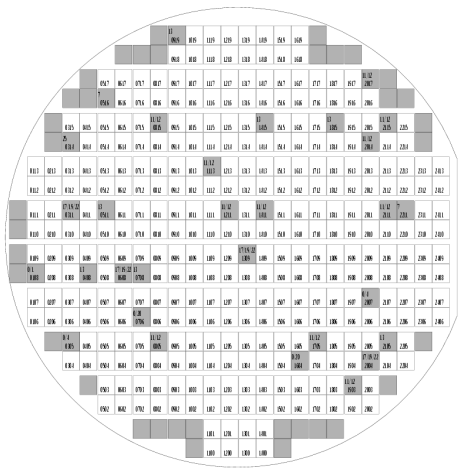
Wafer Map: K8MG5RT



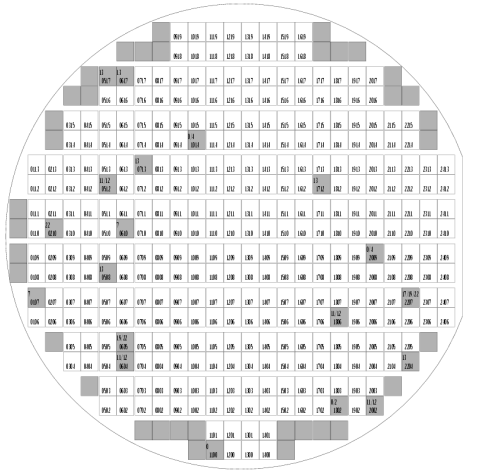
Wafer Map: X04AQYT



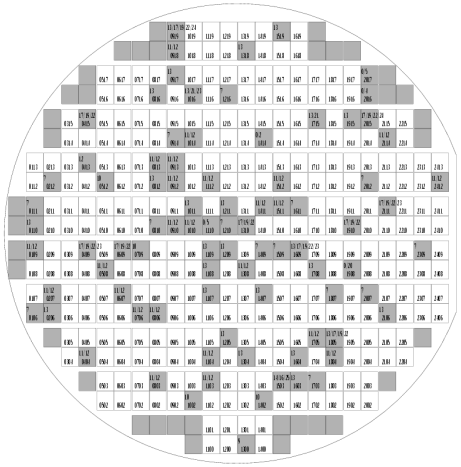
Wafer Map: X04ARFT



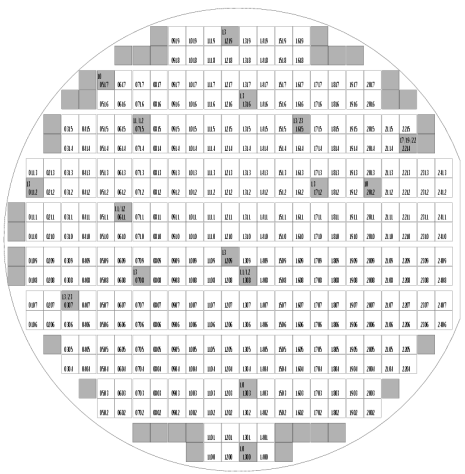
Wafer Map: X04BSWT



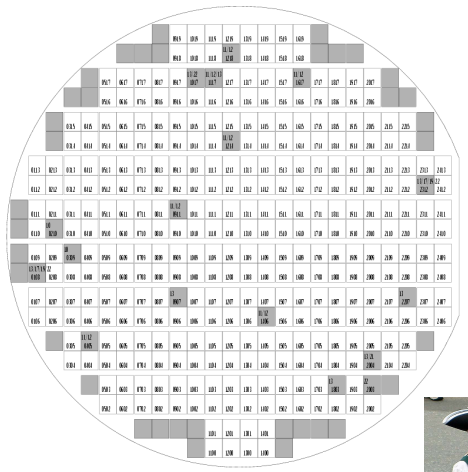
Wafer Map: X14AQXT



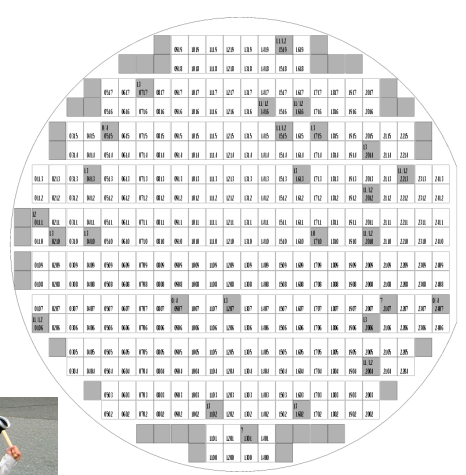
Wafer Map: X14ARET



Wafer Map: X5482PT



Wafer Map: X6482NT



And the final tally is.....

Number of good APV25-S1 chips

Dear all,

8 APV wafers are on their way to Bernd.
I would expect them to get there early next week.
The wafer identities (marked on the edges of the wafers) are:

K8MG5RT (lot 23) 339 KGD
X5482PT (lot 24) 343 KGD
X6482NT (lot 24) 333 KGD
X04ARFT (lot 29) 330 KGD
X14ARET (lot 29) 344 KGD
X14AQXT (lot 29) 274 KGD
X04AQYT (lot 29) 333 KGD
X04BSWT (lot 29) 341 KGD

KGD = known good die (chips that have passed the wafer probe test)
so there will be 2637 good chips altogether.

Wafer maps can be found on the web page
http://www.hep.ph.ic.ac.uk/~silicon/
in various formats.

Cheers, Mark.

Mark Raymond
Blackett Laboratory
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London SW7 2BW fax: +20 7823 8830

Dicing options

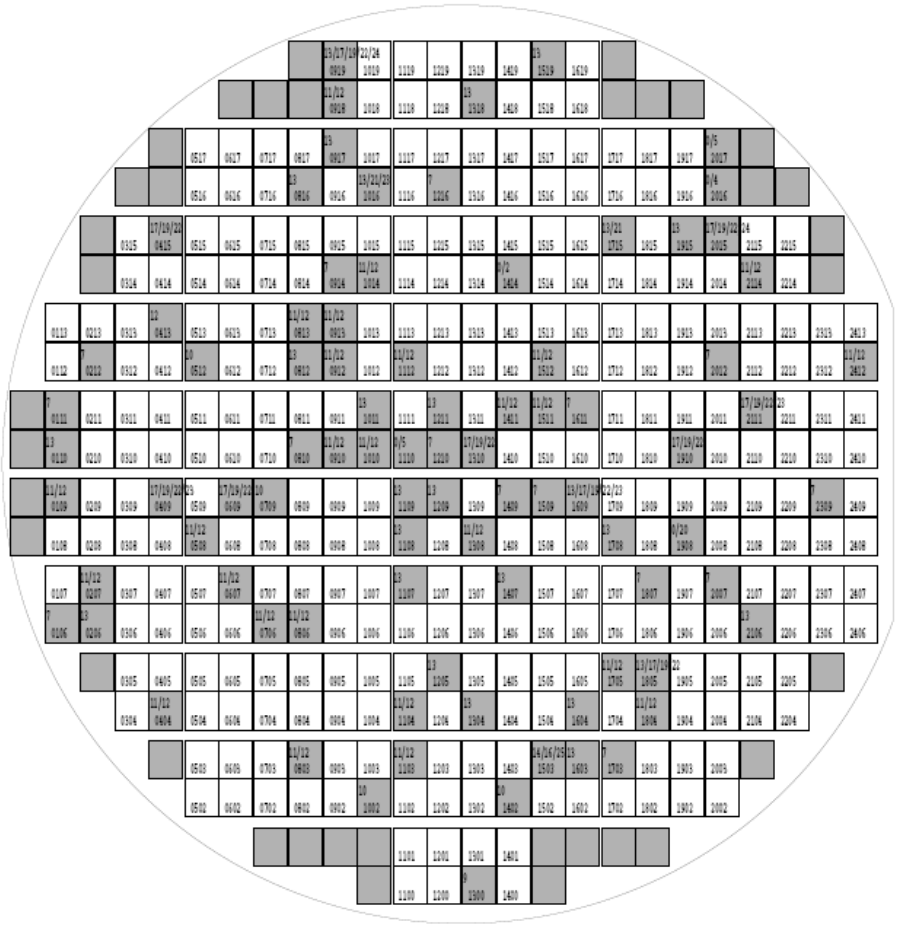
San Jose, CA based
Used with success by LBNL

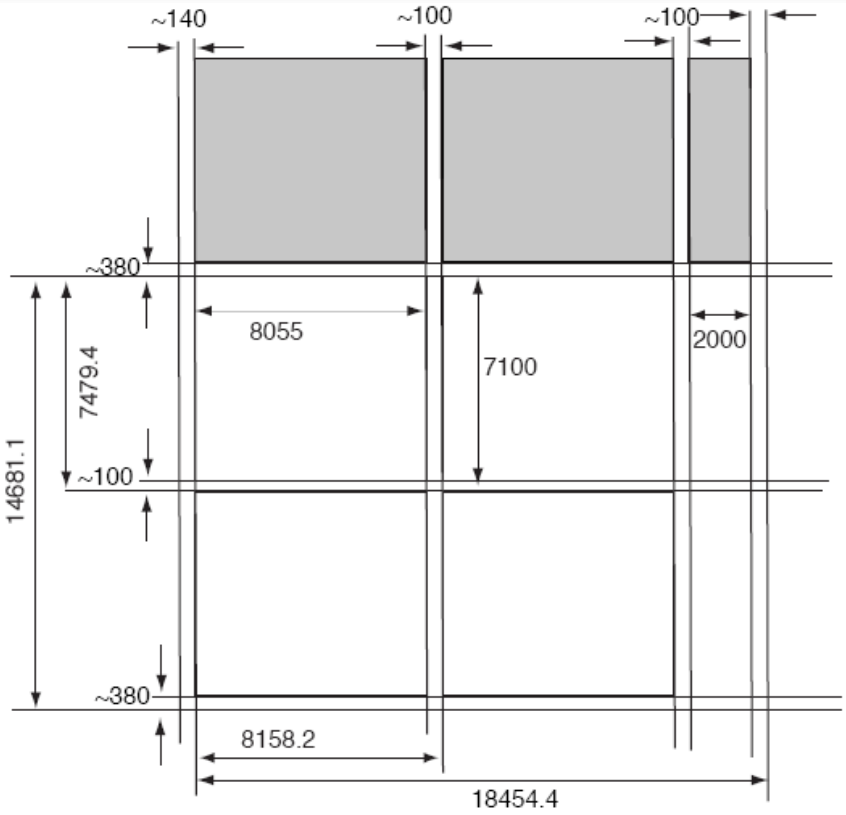
San Jose, CA based
Used with success by LBNL

Upton, NY based
Laser dicing machine

Dicing information

Water Map: X14AQXT





Date probed:	Tue 07 Jun 2005
Chips passed:	274/360
Yield:	76%
Digital failures:	7
Power supply failures:	15
Channel defects (Peds & Cal):	43
Pipeline defects:	26

We have the 8 wafers
We have the reticle drawing
Minimize the dicing cuts
Get quotation.....

Dicing quotation

American Precision Dicing Inc.

642 Giguere Ct.
San Jose, CA 95133
(408) 254-1600
www.wafer-dicing.com

Quote

Date	Quote #
2/23/2009	4628

Company
Massachusetts Intitute of Technology Lab for Nuclear Science 77 Massachusetts Ave. Cambridge, MA 021394307

Terms	Rep	FOB
C.O.D.	LI	San Jose

Item	Description	Qty	Unit Cost	Total
Dicing	Mount, Dice & Inspt. Service to Dice 8" Silicon Wafer into 8.055mm x 7.1mm. Also, to include extra cuts to remove wider lanes. P/N X14ARET & APV_Reticle.	1	146.00	146.00
Jumbo Mounting ...	Jumbo Mounting Ring. (Harmonic code 844790.0000) ALL returns must be accompanied with an Invoice number. Full credit if returned within 30 days in original condition. If returned after 30 days customer will receive 25% credit. No credit if shipping hazardous materials. In house credit only.	1	9.75	9.75
Jumbo Clamshell	Jumbo Clamshell for 8" or larger wafers. (Harmonic code 844790.000) ALL returns must be accompanied with Invoice number. Full credit if returned within 30 days in original condition. If returned after 30 days customer will receive 25% credit. No credit if shipping hazardous materials. In house credit only.	1	10.75	10.75

Subtotal	$166.50
Sales Tax (0.0%)	$0.00
Total	$166.50

American Precision Dicing Inc.

642 Giguere Ct.
San Jose, CA 95133
(408) 254-1600
www.wafer-dicing.com

Quote

Date	Quote #
2/23/2009	4629

Company
Massachusetts Intitute of Technology Lab for Nuclear Science 77 Massachusetts Ave. Cambridge, MA 021394307

Terms	Rep	FOB
C.O.D.	LI	San Jose

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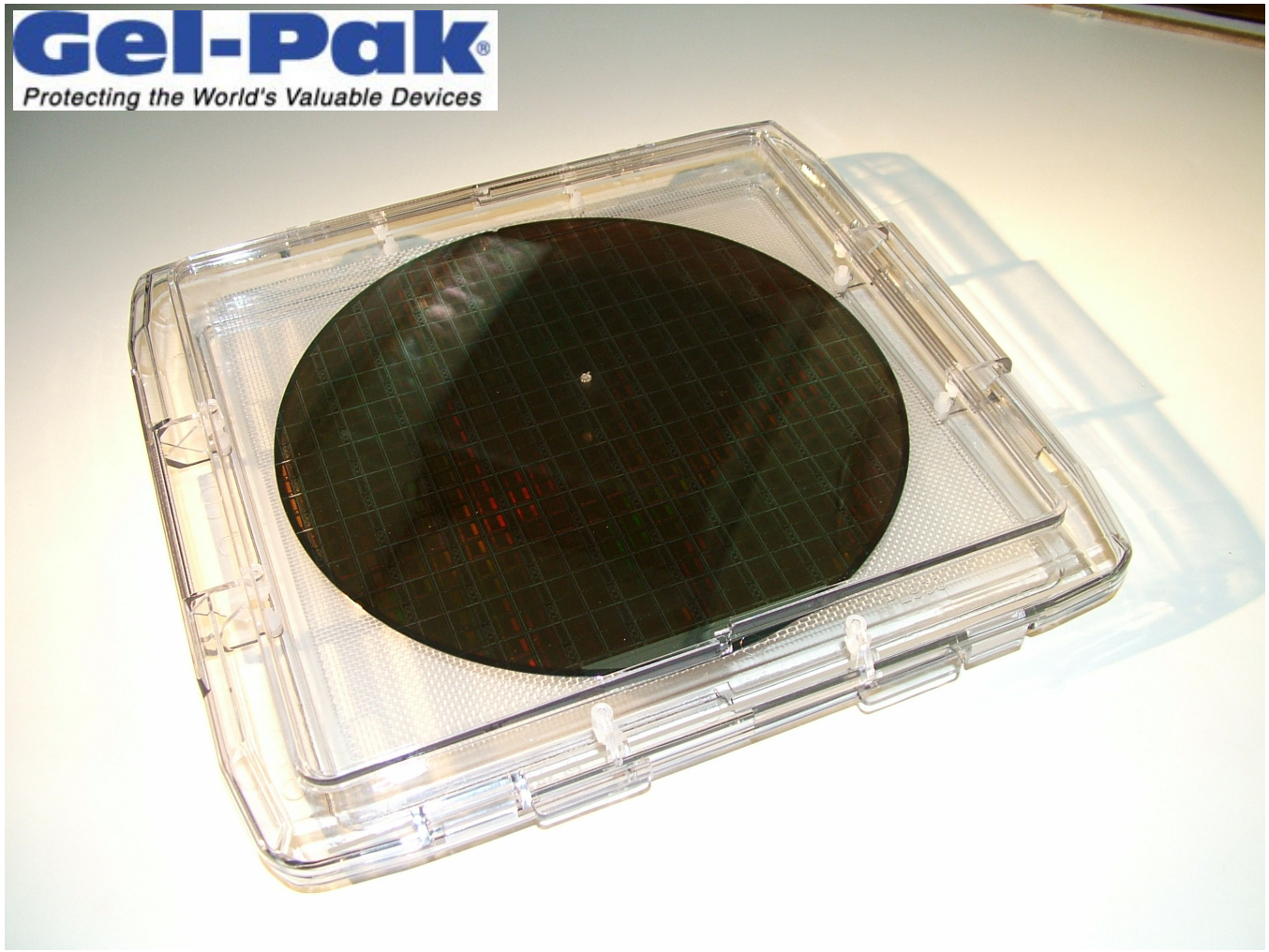
Dicing	Mount, Dice & Inspt. Service to Dice 8" Silicon Wafers into 8.055mm x 7.1mm. Also to include extra cuts to remove wider lanes. Wafer # X14ARET & APV_Reticle.	7	146.00	1,022.00
Jumbo Mounting ...	Jumbo Mounting Ring. (Harmonic code 844790.0000) ALL returns must be accompanied with an Invoice number. Full credit if returned within 30 days in original condition. If returned after 30 days customer will receive 25% credit. No credit if shipping hazardous materials. In house credit only.	7	9.75	68.25
Jumbo Clamshell	Jumbo Clamshell for 8" or larger wafers. (Harmonic code 844790.000) ALL returns must be accompanied with Invoice number. Full credit if returned within 30 days in original condition. If returned after 30 days customer will receive 25% credit. No credit if shipping hazardous materials. In house credit only.	7	10.75	75.25

Subtotal	$1,165.50
Sales Tax (0.0%)	$0.00
Total	$1,165.50

Dicing first wafer



← Shipped to APV
Arrived yesterday

Back diced to MIT on tape
next week

Take off tape and store
chips in Gel-Paks

Test some chips

Concluding remarks

We have 8 APV25-S1 wafers

These wafers should provide plenty of readout chips for both FGT and IST

First wafer out for dicing, back next week

Test some chips, if OK then dice remaining 7 wafers